New Hampshire Groundwater Level Monitoring

January, 2021

New Hampshire Geological Survey
29 Hazen Drive, PO Box 95
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February 3, 2021

GROUNDWATER CONDITIONS SUMMARY

Neither NOAA nor the Northeast Regional Climate Center (NRCC) at Cornell University have yet released their January precipitation statistics, which are expected to be released next week and will be crucial data to consider during the current drought. In the absence of those summaries, NRCC reports that precipitation across New Hampshire between December 28th and January 26th was below average (Figure 1). More precipitation figures here.

As of January 26th, 54% of the state was abnormally dry, and 15% was in moderate drought (Figure 2). Both abnormally dry and moderate drought conditions have increased slightly since last month. The precipitation and subsequent snowmelt in December had raised groundwater levels across much of the state. In January, however, those higher levels have dropped to more normal levels for this time of year. Regardless of the January drop in levels, the vast majority of groundwater levels in the network are still higher than they were in November, reflecting a steady recovery from drought conditions. See the histograms below and note to the December peak.

Figures 1 and 2 show the monthly status of groundwater levels for both bedrock and overburden wells in the network. Only wells with a period of record (POR) 10 years or more are placed within statistical categories of low through high (symbols red through blue, respectively). Bedrock wells are installed into bedrock and overburden wells are installed in the unconsolidated materials above bedrock.

The majority of the wells in southeast and central New Hampshire are experiencing normal to high groundwater levels. The exceptions are below average levels in Deerfield (overburden), Franklin, Greenfield, and Ossipee, all of which had experienced a rise in groundwater levels since last month. Groundwater levels in the Connecticut River Valley, where drought persists, have dropped. The overburden well in Lancaster remains low, and levels in the overburden wells in Colebrook, Lisbon, and Newport have all fallen.

The New Hampshire Geological Survey's groundwater monitoring network (Figures 1 and 2) currently includes 11 bedrock and 20 overburden observation wells, all of which are measured monthly by hand. Using the monthly hand readings, monthly averages and percentile statistics were calculated and are summarized in Figures 1 and 2, the following hydrographs*, and in Table 1.

*The hydrographs show the following data over a period of 12 months: (1) monthly groundwater depths in red, (2) the monthly average over the period of record (POR) of the well in black, and (3) color-coded statistical ranges over the POR of the well. Note the POR is listed below each month's column on the chart and reported as the number of measurements for that respective month. This might include multiple readings in the same month and does not include any gaps in data so therefore may not represent a continuous period.

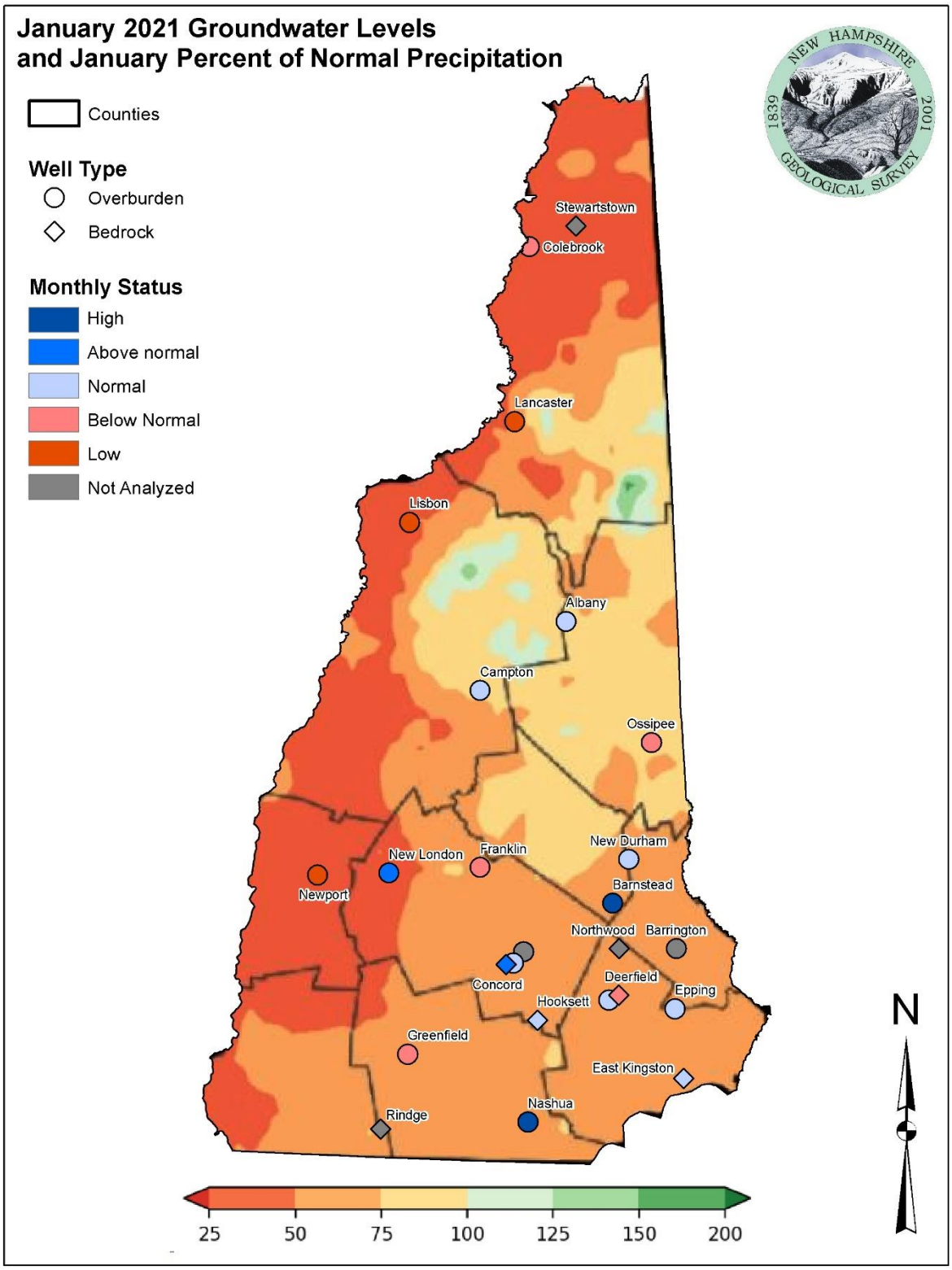


Figure 1. Groundwater Monitoring Network showing groundwater levels relative to statistical envelopes calculated over each well's period of record (POR) and percent normal precipitation map for December 28, 2020 – January 26, 2021 (Northeast Regional Climate Center).

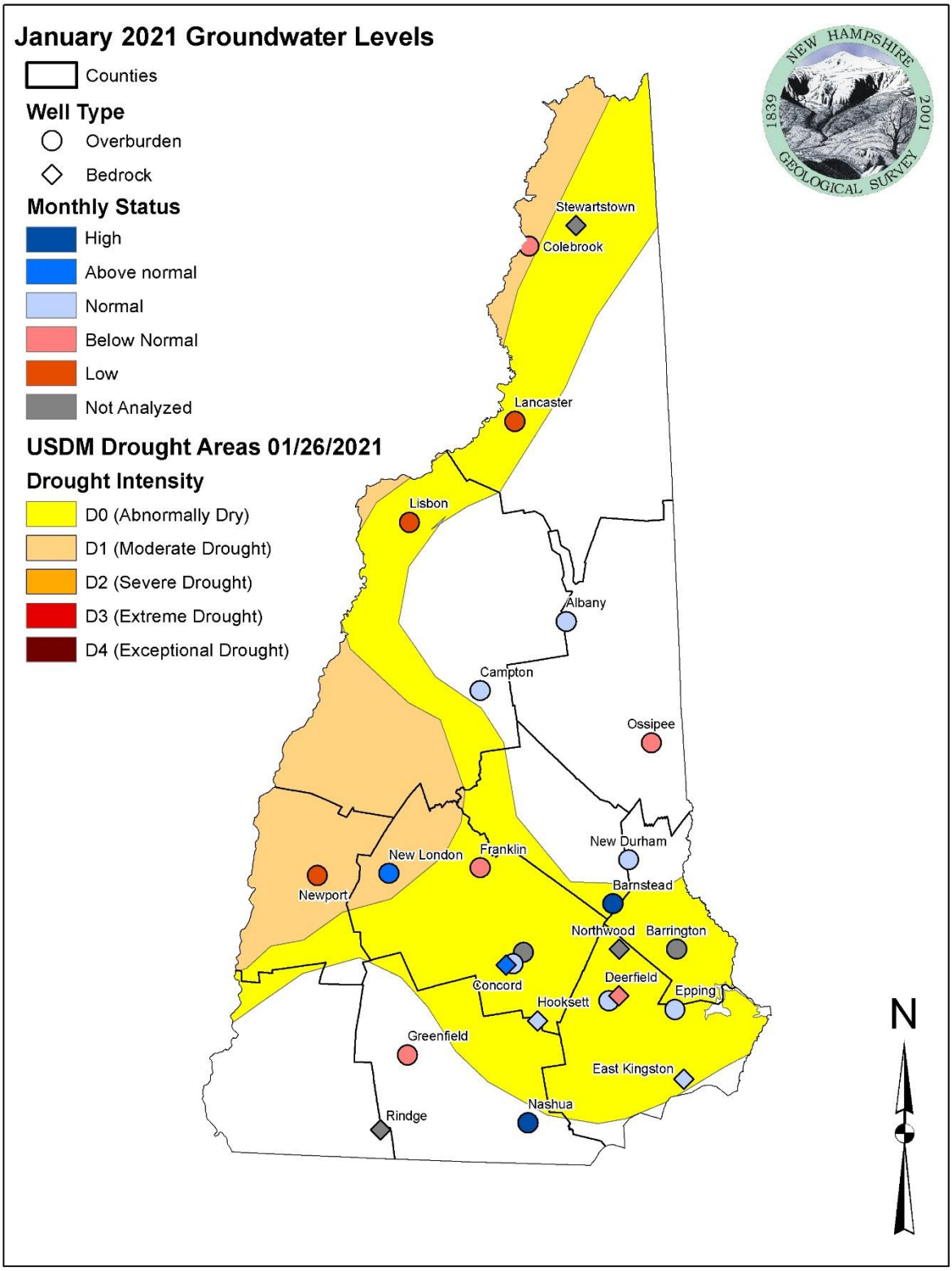
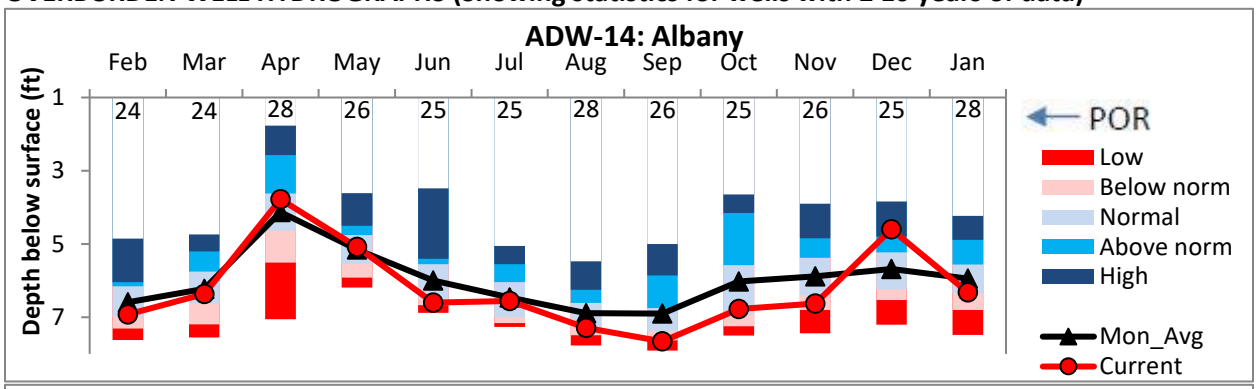
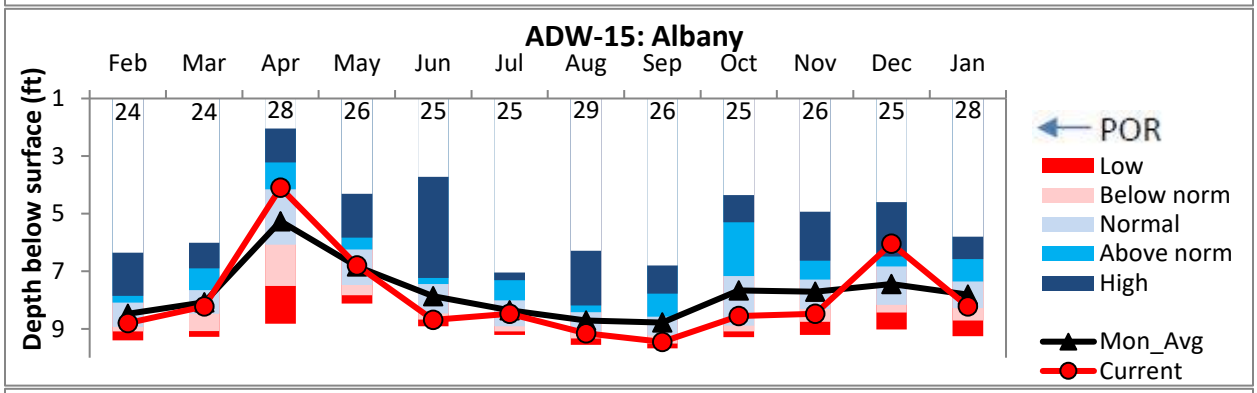
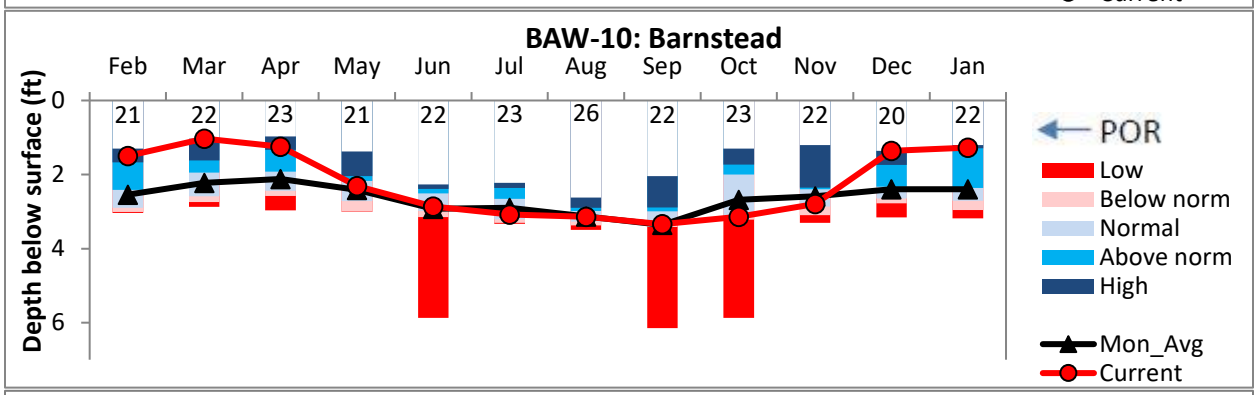


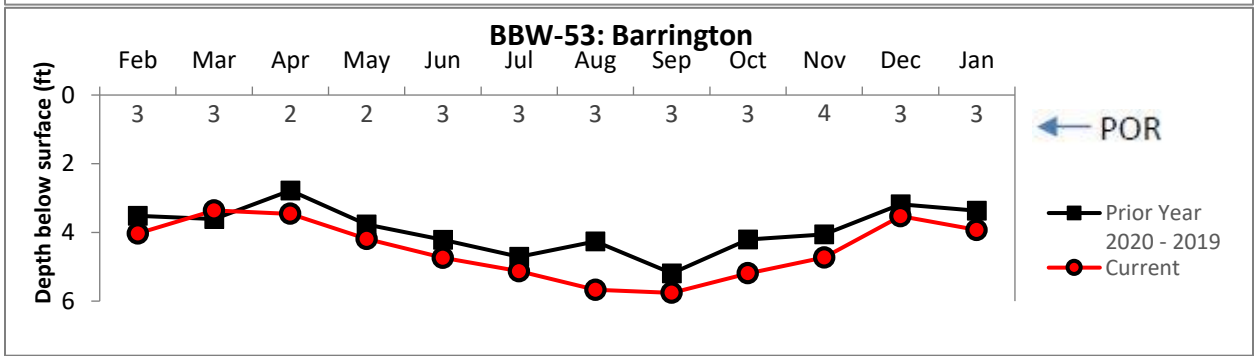
Figure 2. Groundwater Monitoring Network showing groundwater levels relative to statistical envelopes calculated over each well's period of record (POR) and drought areas according to data released by the U.S. Drought Monitor on January 26, 2021.

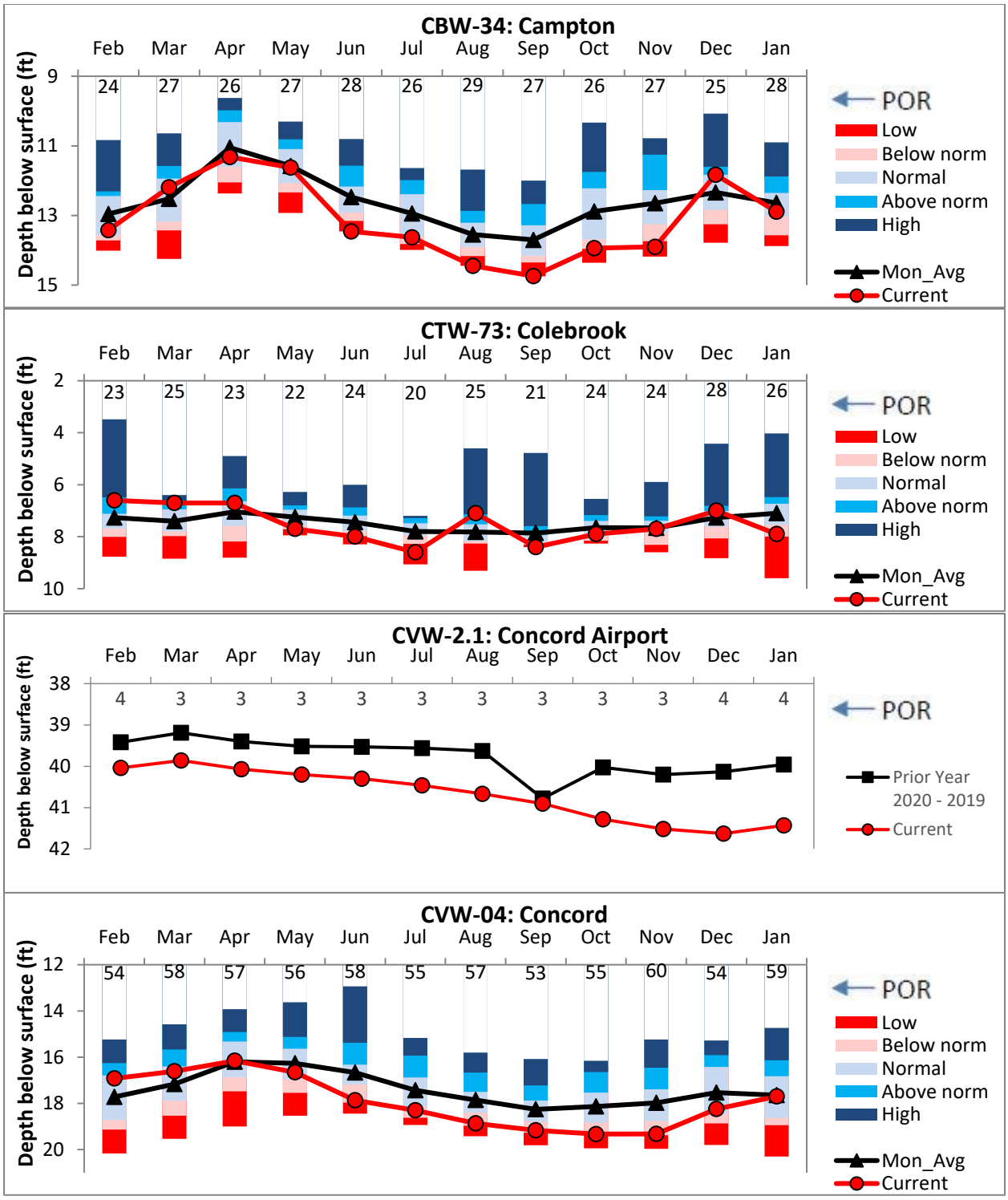
OVERBURDEN WELL HYDROGRAPHS (Showing statistics for wells with ≥ 10 years of data)

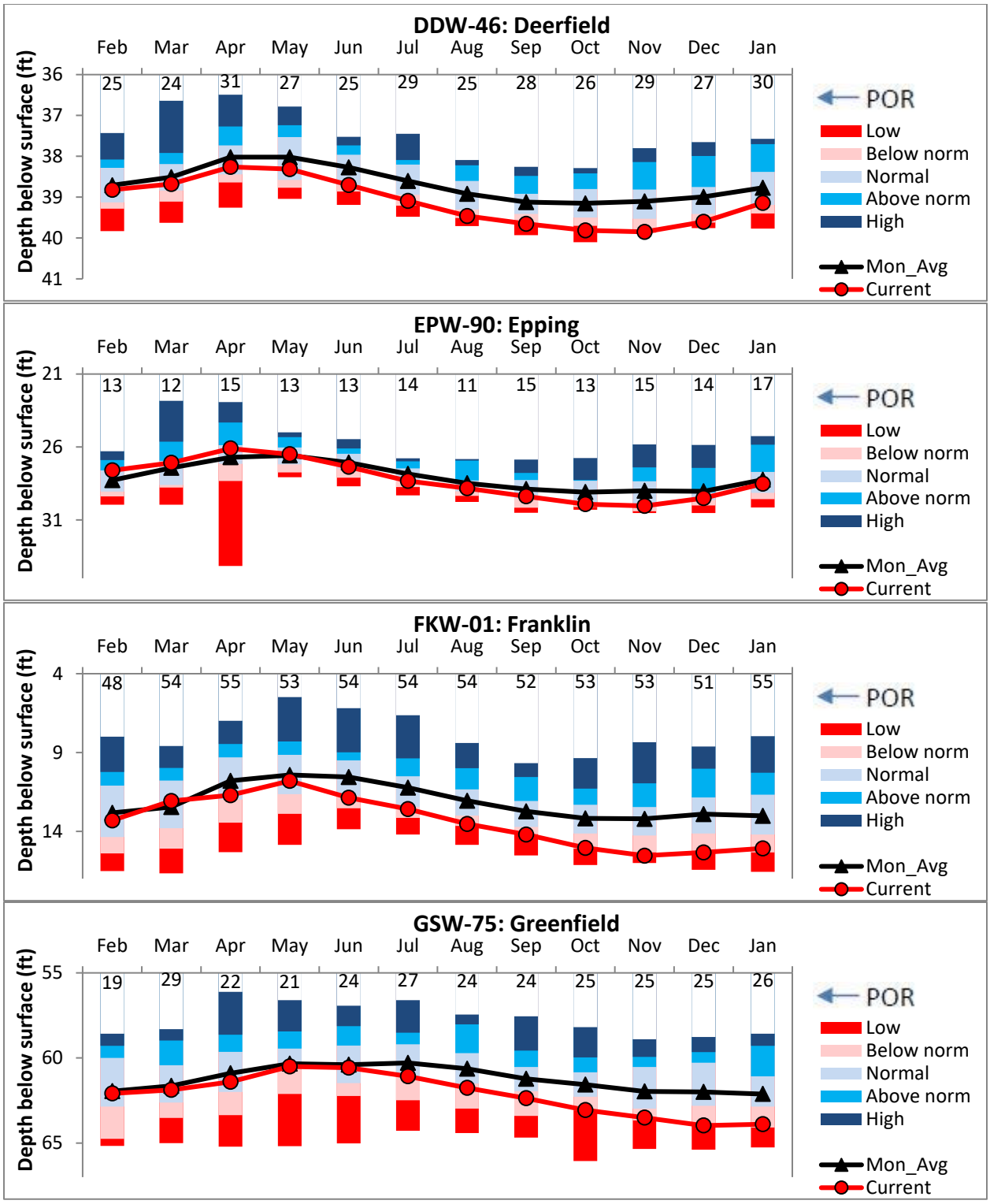


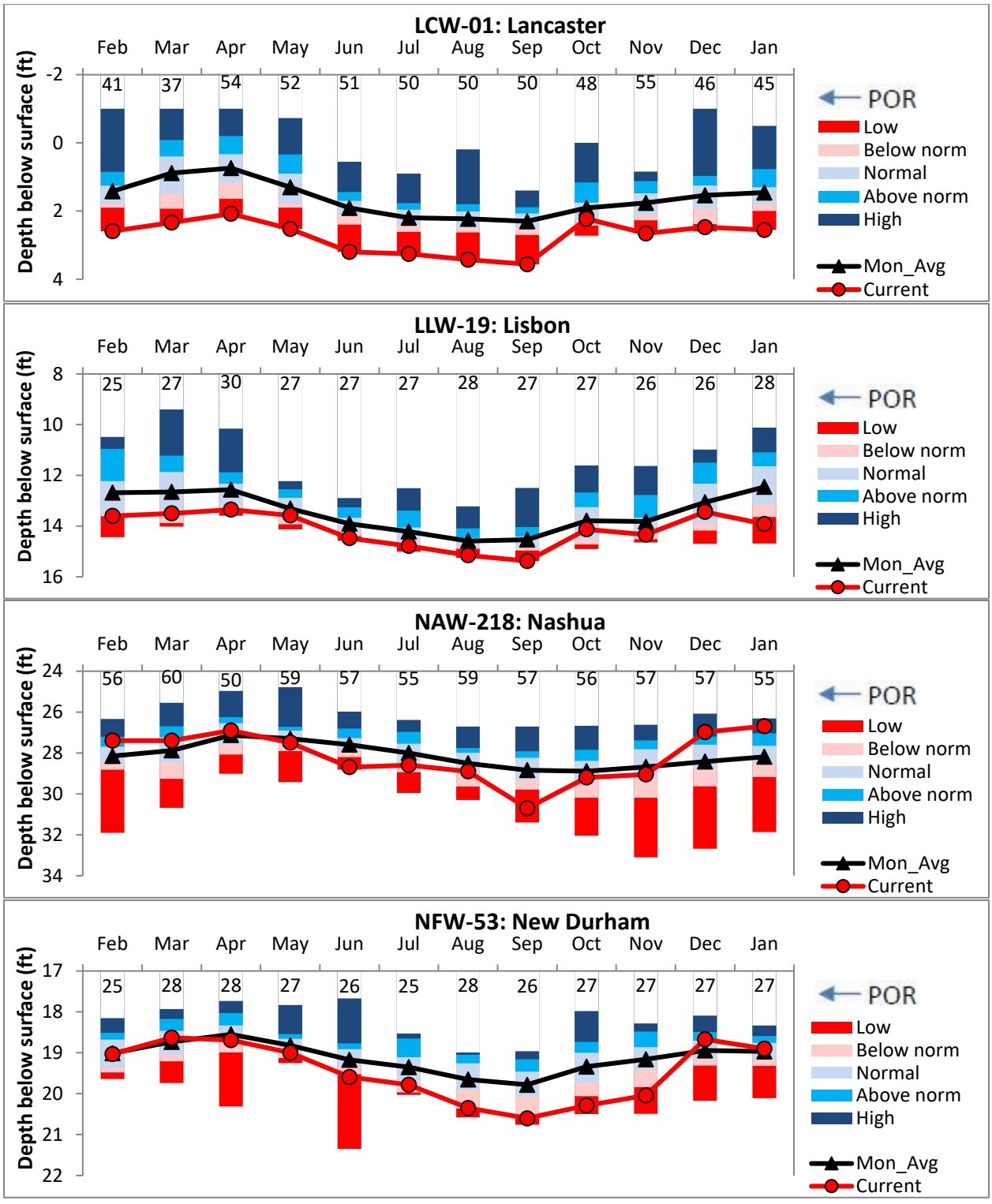


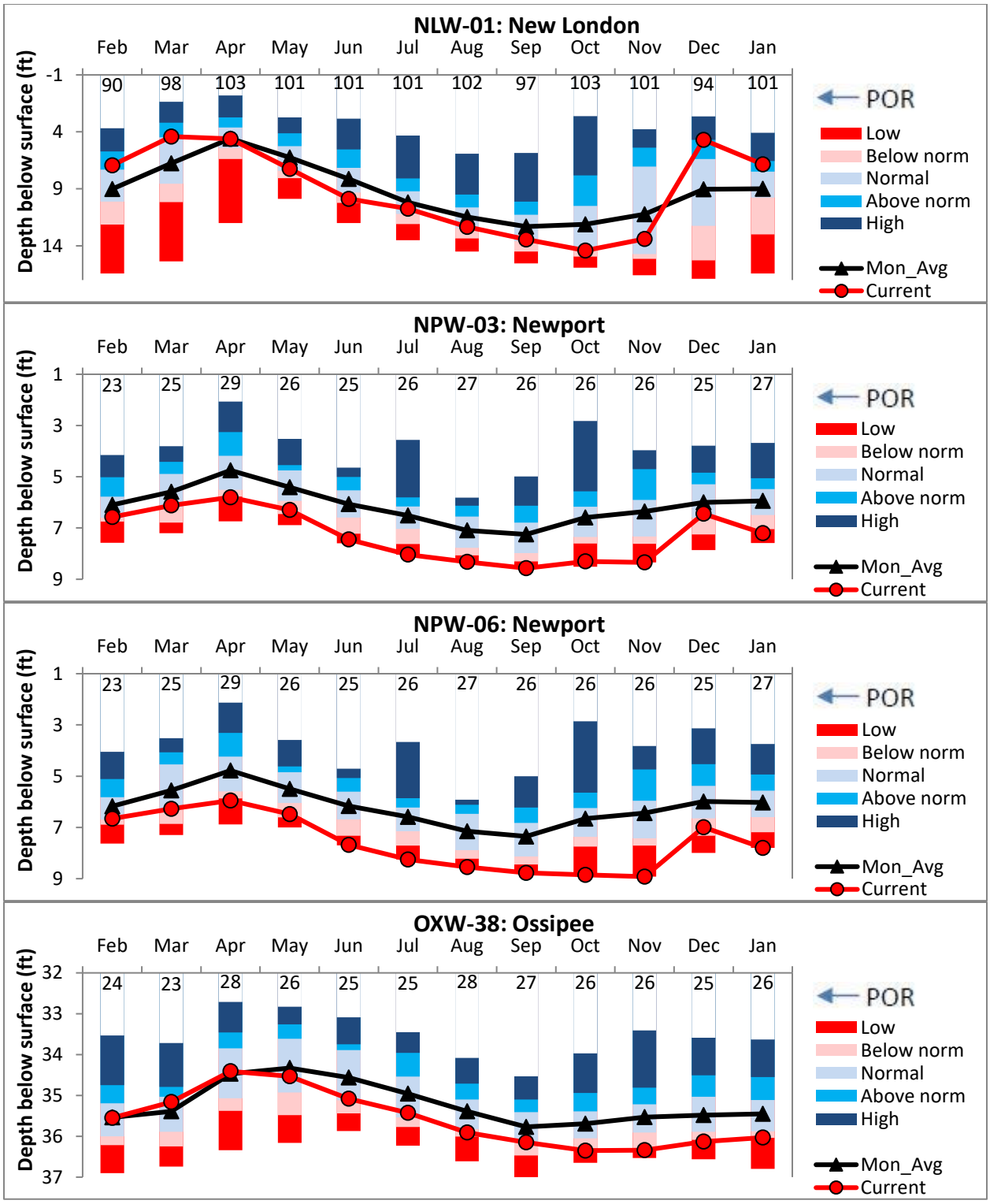




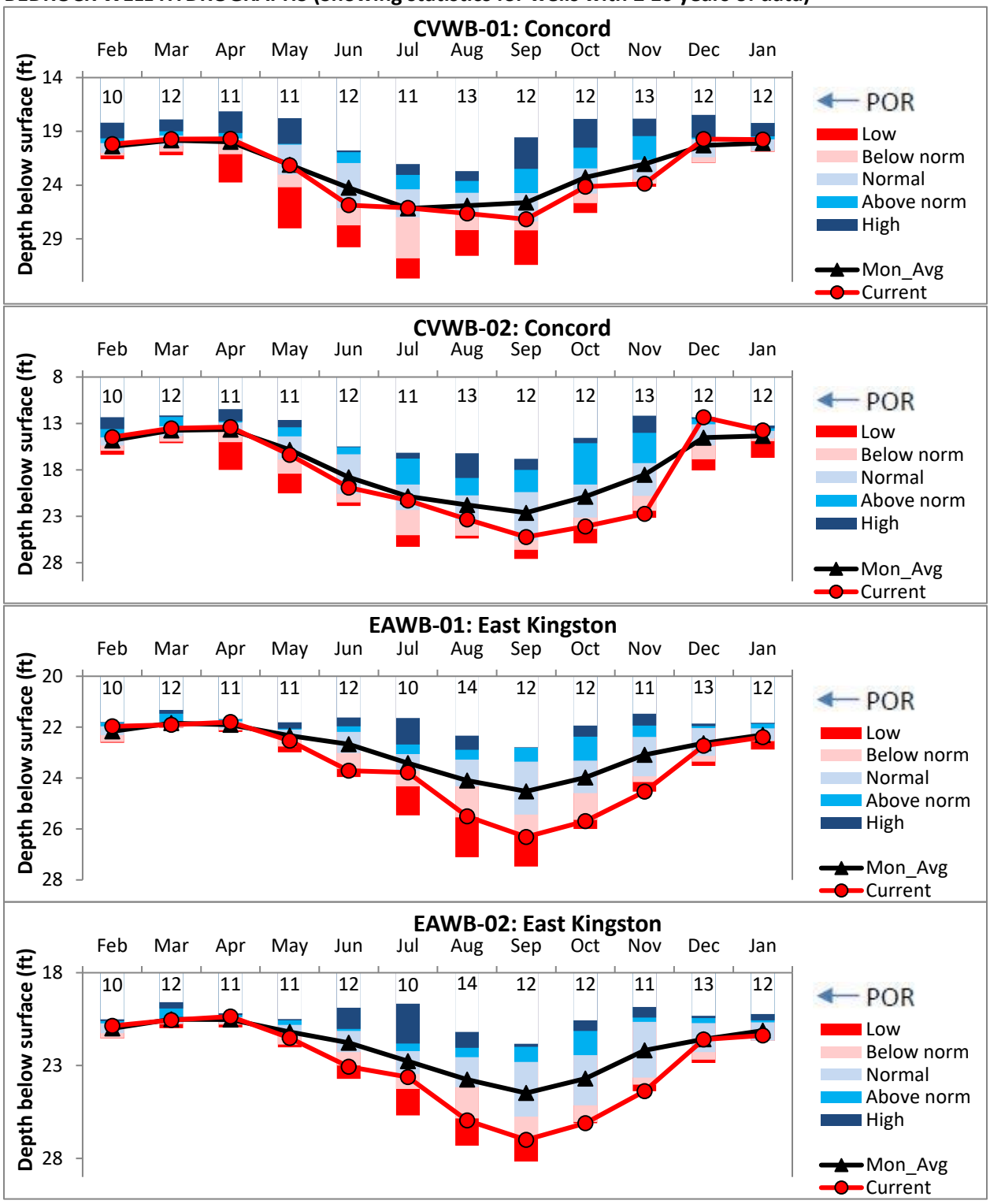

CBW-34: Campton
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
9 11 13 15
24 27 26 27 28 26 29 27 26 27 25 28
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
CTW-73: Colebrook
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
2 4 6 8 10
23 25 23 22 24 20 25 21 24 24 28 26
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
CVW-2.1: Concord Airport
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
38 39 40 41 42
4 3 3 3 3 3 3 3 3 3 4 4
POR
Prior Year
2020 - 2019
Current
CVW-04: Concord
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
12 14 16 18 20
54 58 57 56 58 55 57 53 55 60 54 59
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

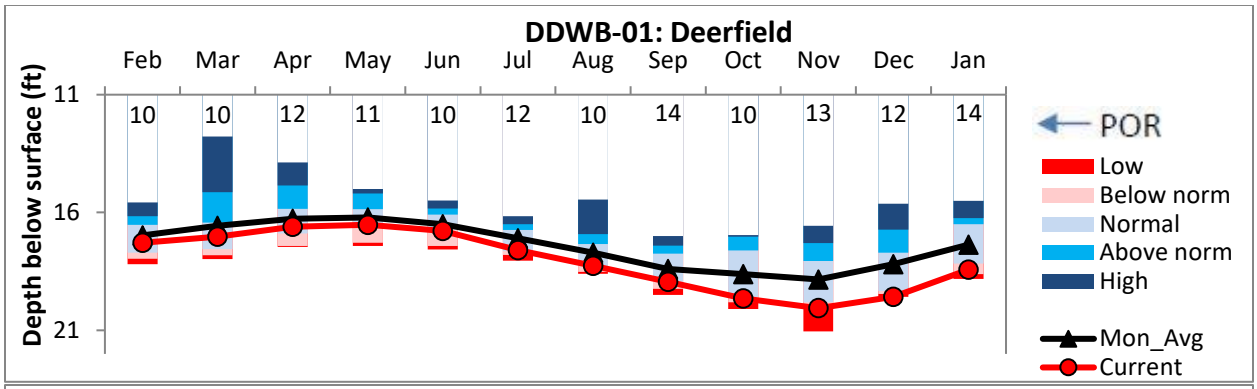

DDW-46: Deerfield
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
36 37 38 39 40 41
25 24 31 27 25 29 25 28 26 29 27 30
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
EPW-90: Epping
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
21 26 31
13 12 15 13 13 14 11 15 13 15 14 17
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
FKW-01: Franklin
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
4 9 14
48 54 55 53 54 54 54 52 53 53 51 55
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
GSW-75: Greenfield
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
55 60 65
19 29 22 21 24 27 24 24 25 25 25 26
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

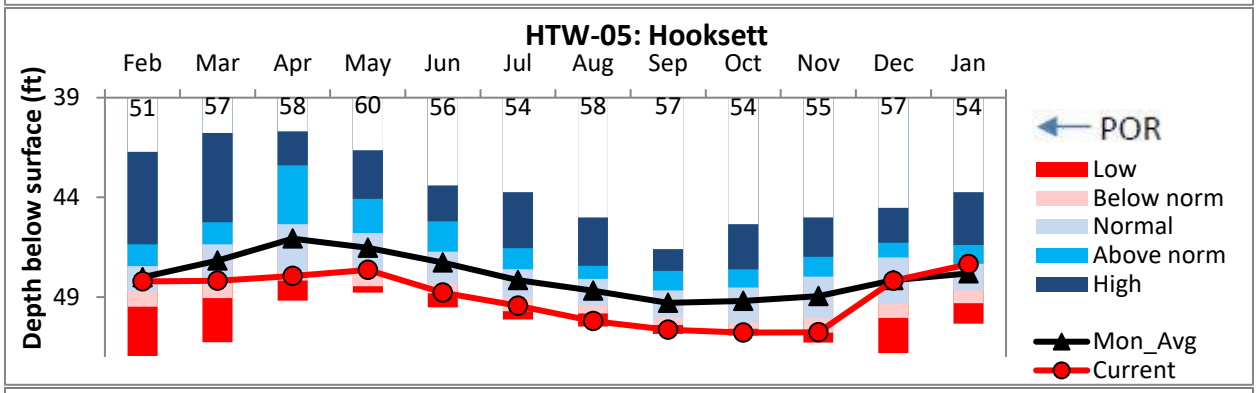

LCW-01: Lancaster
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
-2 0 2 4
41 37 54 52 51 50 50 50 48 55 46 45
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
LLW-19: Lisbon
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
8 10 12 14 16
25 27 30 27 27 27 28 27 27 26 26 28
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
NAW-218: Nashua
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
24 26 28 30 32 34
56 60 50 59 57 55 59 57 56 57 57 55
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
NFW-53: New Durham
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
17 18 19 20 21 22
25 28 28 27 26 25 28 26 27 27 27 27
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

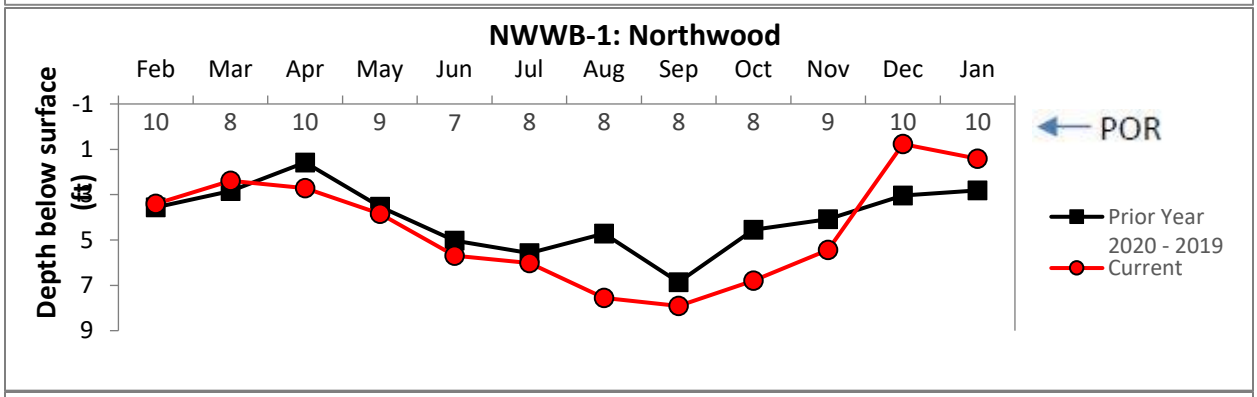

NLW-01: New London
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
-1
4
9
14
90 98 103 101 101 101 102 97 103 101 94 101
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
NPW-03: Newport
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
1
3
5
7
9
23 25 29 26 25 26 27 26 26 26 25 27
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
NPW-06: Newport
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
1
3
5
7
9
23 25 29 26 25 26 27 26 26 26 25 27
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
OXW-38: Ossipee
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
32
33
34
35
36
37
24 23 28 26 25 25 28 27 26 26 25 26
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

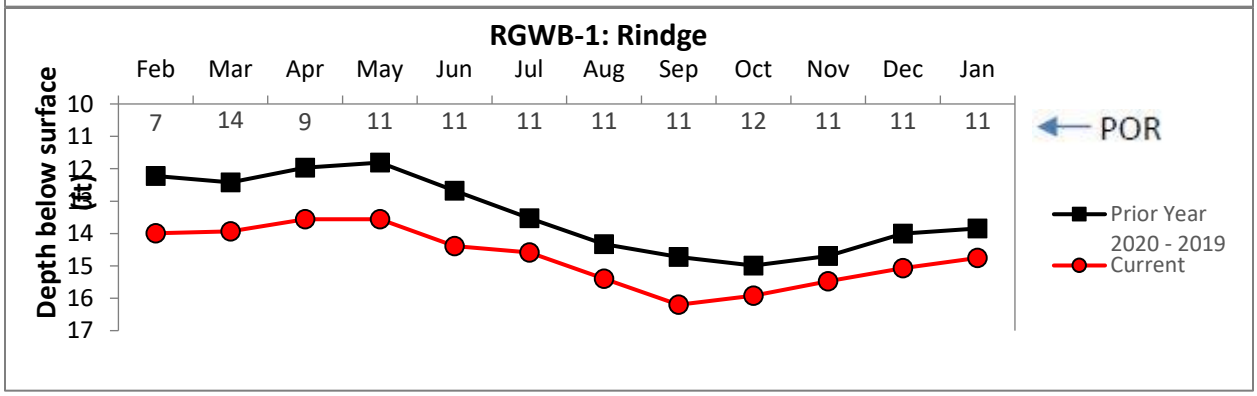
BEDROCK WELL HYDROGRAPHS (Showing statistics for wells with ≥ 10 years of data)




DDWB-01: Deerfield
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
11
16
21
10 10 12 11 10 12 10 14 10 13 12 14
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current


HTW-05: Hooksett
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
39
44
49
51 57 58 60 56 54 58 57 54 55 57 54
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current


NWWB-1: Northwood
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
-1
1
5
7
9
10 8 10 9 7 8 8 8 8 9 10 10
POR
Prior Year
2020 - 2019
Current


RGWB-1: Rindge
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Depth below surface (ft)
10
11
12
14
15
16
17
7 14 9 11 11 11 11 11 12 11 11 11
POR
Prior Year
2020 - 2019
Current

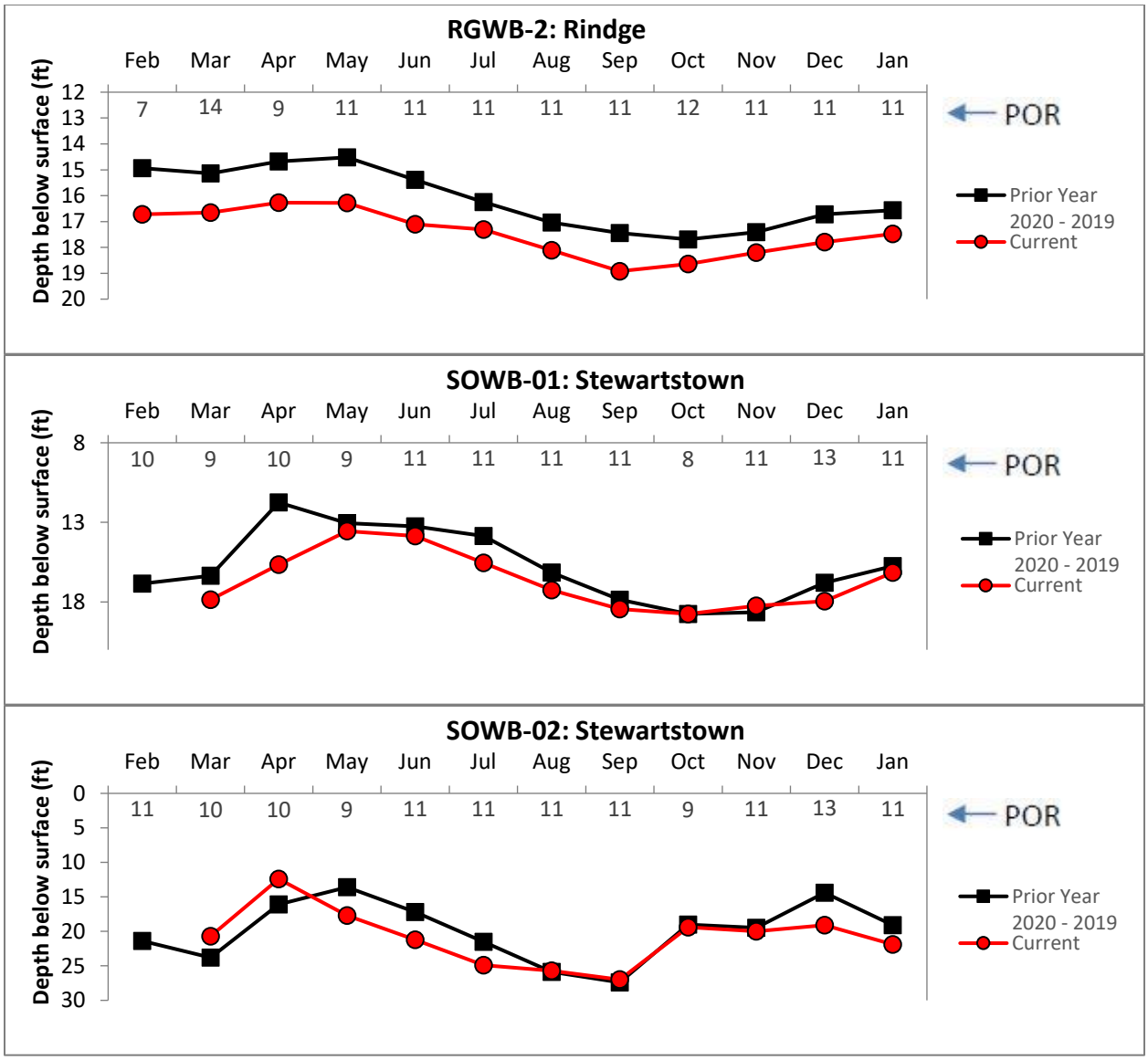

RGWB-2: Rindge
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
7 14 9 11 11 11 11 11 12 11 11 11
Depth below surface (ft)
12 13 14 15 16 17 18 19 20
POR
Prior Year
2020 - 2019
Current
SOWB-01: Stewartstown
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
10 9 10 9 11 11 11 11 8 11 13 11
Depth below surface (ft)
8 13 18
POR
Prior Year
2020 - 2019
Current
SOWB-02: Stewartstown
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
11 10 10 9 11 11 11 11 9 11 13 11
Depth below surface (ft)
0 5 10 15 20 25 30
POR
Prior Year
2020 - 2019
Current

Table 1. Summary of groundwater levels sorted by region (dark blue – high, blue – above normal, light blue – normal, pink – below normal, red – low.

Well	Town	Well type	Screen/ open Interval (ft)	Depth to Water (ft)	Monthly Average (ft)	Current Status	Departure from Avg. (ft)	Change since last month (ft)
ADW-14	Albany	Overburden	77.5-79.5	6.32	5.94	Normal	-0.38	-1.72
ADW-15	Albany	Overburden	16-18	8.22	7.81	Normal	-0.41	-2.18
BAW-10	Barnstead	Overburden	23-25	1.27	2.4	High	1.13	0.09
BBW-53	Barrington	Overburden	21-23	3.93	-	Not Analyzed	-	-0.4
CBW-34	Campton	Overburden	21-23	12.89	12.64	Normal	-0.25	-1.06
CTW-73	Colebrook	Overburden	105-107	7.9	7.1	Below norm	-0.8	-0.9
CVW-02.1	Concord	Overburden	59.8-61.8	41.43	-	Not Analyzed	-	0.2
CVW-04	Concord	Overburden	25-27	17.7	17.65	Normal	-0.05	0.55
DDW-46	Deerfield	Overburden	59.8-61.8	39.14	38.77	Normal	-0.37	0.46
EPW-90	Epping	Overburden	39.45-40.7	28.53	28.24	Normal	-0.29	0.98
FKW-01	Franklin	Overburden	45.5-47.5	15.07	13.01	Below norm	-2.06	0.26
GSW-75	Greenfield	Overburden	35.8-37.8	63.89	62.12	Below norm	-1.77	0.08
LCW-01	Lancaster	Overburden	28-30	2.55	1.46	Low	-1.09	-0.08
LLW-19	Lisbon	Overburden	49.8-52.3	13.92	12.46	Low	-1.46	-0.48
NAW-218	Nashua	Overburden	66-68	26.69	28.19	High	1.5	0.29
NFW-53	New Durham	Overburden	28-30	18.9	18.97	Normal	0.07	-0.23
NLW-01	New London	Overburden	40-42	6.84	8.98	Above norm	2.14	-2.15
NPW-03	Newport	Overburden	40.5-42.5	7.2	5.94	Low	-1.26	-0.76
NPW-06	Newport	Overburden	58-60	7.8	6.03	Low	-1.77	-0.81
OXW-38	Ossipee	Overburden	0-22.55	36.03	35.45	Below norm	-0.58	0.1
CVWB-01	Concord	Bedrock	470-480	19.77	20.09	Normal	0.32	-0.04
CVWB-02	Concord	Bedrock	0-315	13.74	14.34	Above norm	0.6	-1.41
DDWB-01	Deerfield	Bedrock	0-300	18.42	17.36	Below norm	-1.06	1.16
EAWB-01	East Kingston	Bedrock	463-473	22.39	22.3	Normal	-0.09	0.34
EAWB-02	East Kingston	Bedrock	0-323	21.38	21.12	Normal	-0.26	0.22
HTW-05	Hooksett	Bedrock	0-102.7	47.35	47.81	Normal	0.46	0.84
NWWB-01	Northwood	Bedrock	0-130	1.42	-	Not Analyzed	-	-0.65
RGWB-01	Rindge	Bedrock	391-401	14.75	-	Not Analyzed	-	0.32
RGWB-02	Rindge	Bedrock	0-285	17.48	-	Not Analyzed	-	0.31
SOWB-01	Stewartstown	Bedrock	443-453	16.15	-	Not Analyzed	-	1.8
SOWB-02	Stewartstown	Bedrock	0-303	21.9	-	Not Analyzed	-	-2.8